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अखरोट — विशिष्टि

(पहला पुनरीक्षण)

Walnuts — Specification

(First Revision)

ICS 67.080.10

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July 2016 **Price Group 3**

Fruits, Vegetables and Allied Products Sectional Committee, FAD 10

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by Fruits, Vegetable and Allied Products Sectional Committee had been approved by the Food and Agriculture Division Council.

This standard was first published in 1975 and was based on the instructions for Grading and Marketing of in-shell and shelled walnuts under AGMARK, Marketing Series No. 184, issued by the Directorate of Marketing and Inspection, Ministry of Agriculture and Irrigation, Faridabad. This revision is being undertaken to align it with the AGMARK standard for grading and marketing of in-shell and shelled walnuts which has been revised vide the *Fruits and Vegetables Grading and Marking (Amendment) Rules*, 2010 under AGMARK.

Walnuts occupy more land in Kashmir than any other fruit except apple and are grown to a smaller extent in other areas of the Himalayas. The walnut is considered indigenous to the region from Persia to Kashmir, the nuts would keep for months at ordinary temperatures and are not subjected to bruising. Therefore, they have distinct advantages for those sections of the hills where transportation to the market is a problem. Due to various advantages, cultivation of walnuts is increasing in the country.

It is hoped that this specification would help in the quality control of walnuts for internal trade and export.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
WALNUTS — SPECIFICATION
(First Revision)

1 SCOPE

This standard specifies requirements and methods of sampling and test for in-shell and shelled walnuts (*Juglans regia*).

2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards:

IS No.	*Title*
2566 : 1993	Textiles - B-twill jute bags for packing foodgrains — Specification (*third revision*)
4624 : 1978	Specification for dehydrated peas (*first revision*)

3 DEFINITIONS

For the purpose of this standard, the following definitions shall apply.

3.1 Damaged — Damaged from pressure and other mechanical factors resulting in broken shells, perforated shells, etc.

3.2 Foreign Matter — Extraneous matter, such as dirt, sand, etc.

3.3 Wrinkled — Caused by lack of water and minerals.

3.4 Decay — Resulting from the action of moulds and insects.

4 REQUIREMENTS

4.1 In-Shell Walnuts

In-shell walnuts shall be the fruit obtained from varieties (cultivars) of plant *Juglans regia (L).* In-shell walnuts are of two types namely:

a) 'Fresh walnuts' or 'Early walnuts' are walnuts which are marketed soon after harvesting and cannot be preserved for a long time, from which the husk has been removed and which have not been treated in any way that tends to change their natural moisture content.

b) 'Dry walnuts' are walnuts which can be preserved for a long time under normal conditions of storage.

4.1.1 *Minimum Requirements*

4.1.1.1 *In-shell walnuts*

4.1.1.1.1 In-shell walnuts shall be,

a) intact, shall not be split or perforated; slight superficial damage is not considered a defect; partially open walnuts are considered to be intact provided that the kernel is physically protected;
b) sound;
c) well matured;
d) clean, practically free of any visible foreign matter;
e) dry, free of abnormal external moisture;
f) free from residues of husk;
g) free from damage caused by pests; and
h) free from oil stains, sunburns and residue of chemical bleaching.

4.1.1.1.2 They shall not be empty and stony.

4.1.1.2 Kernels shall be,

a) firm;
b) normally developed, shrivelled kernels are to be excluded;
c) clean, practically free of any visible foreign matter;
d) free from living insects, mites or other parasites;
e) free of damage caused by pests;
f) free from rancidity or oily appearance;
g) free from visible mould;
h) free of abnormal external moisture;
j) free of foreign smell or taste; and
k) free from darkening, oil seepage or rancidity.

4.1.1.3 Kernels shall comply with the requirements of residue levels of heavy metals, pesticides and other contaminants and other food safety parameters as laid down by the Codex Alimentarius Commission for exports.

4.1.1.4 The moisture content for fresh walnuts shall be

20 percent and above. Moisture content of dry walnuts in shell shall not be more than 12 percent and not more than 8 percent for the kernels. Moisture content shall be determined according to the method given in Appendix A of IS 4624.

4.1.2 *Provisions Concerning Sizing*

4.1.2.1 Size is determined by the minimum diameter of the walnut as given in Table 1. Extra Class and Class I shall not be graded in Size Code E.

Table 1 Minimum Diameter of Walnuts

(*Clause* 4.1.2.1)

Sl No. (1)	Size Code (2)	Minimum Diameter of the Walnut (3)
i)	A	32 mm and above
ii)	B	30 mm and above
iii)	C	28 mm and above
iv)	D	26 mm and above
v)	E	24 mm and above

4.1.2.2 *Size tolerances*

10 percent by number of walnuts in-shell not conforming to the size mentioned on the package.

4.2 Shelled Walnuts

Shelled walnuts shall be the edible kernels of walnuts obtained from varieties of *Juglans regia (L).*

4.2.1 *Minimum Requirements*

4.2.1.1 Shelled walnuts shall be,

a) sufficiently dry to ensure keeping quality;
b) sound, produce affected by rotting or deterioration such as to make it unfit for human consumption is excluded;
c) fresh in appearance;
d) clean, practically free of any visible foreign matter;
e) free of damage caused by low and/or high temperature;
f) free of external moisture, excluding condensation following removal from cold storage;
g) free of any foreign smell and/or taste;
h) free from walnut-meal or flour;
j) free from residue of husk;
k) free of damage caused by pests;
m) free from oily appearance and/or rancidity; and
n) edible and having characteristic taste and aroma.

4.2.1.2 Shelled walnuts shall not be,

a) diseased, mouldy or shrivelled; and
b) worm-eaten.

4.2.1.3 Acid insoluble ash shall not be more than 0.1 percent, when determined according to the method given in Appendix F of IS 4624.

4.2.1.4 Moisture content not to exceed 5 percent, when determined according to the method given in Appendix A of IS 4624.

4.2.1.5 Shelled walnuts shall comply with the residue levels of heavy metals, pesticides and other contaminants and other food safety parameters as laid down by the Codex Alimentarius Commission for exports.

4.2.2 *Provisions Concerning Sizing*

4.2.2.1 Walnut shelled are classified by style/sizing as follows:

a) *Halves* — Kernels separated into two more or less equal and intact parts; that is undamaged separate cotyledons of fully developed kernels.
b) *Quarters* — Half of a cotyledon including chipped kernels.
c) *Large pieces* — Portions smaller than a 'chipped kernel' but larger than a 'broken piece'. chipped kernel means a portion representing at least three-quarters of a 'half';
d) *Small/broken pieces* — Portion of kernels which can pass through a 8 mm sizing screen but not through a 3 mm sizing screen;
e) *Crumbs* — Portion of kernels which cannot pass through 2 mm sieve. Crumbs shall not be graded in extra class.
f) *Combination* — Combination of kernels of different styles. Percentage of each style to be specified in the marking.

4.2.2.2 *Size tolerances*

Size tolerances for walnuts shelled as classified in **4.2.2.1** are given below:

a) *Halves* — 15 percent by weight of the kernels of which not more than 5 percent shall be quarters and large pieces and not more than 1 percent each shall be small/broken pieces and crumbs.
b) *Quarter* — 15 percent by weight of the kernels of which not more than 5 percent shall be small/broken pieces and crumbs shall not exceed 1 percent .
c) *Large pieces* — 15 percent by weight of the kernels of which crumbs shall not exceed 1 percent.

d) *Small/broken pieces* — 15 percent by weight of the kernels of which crumbs shall not exceed 2 percent.

e) *Crumbs* — 15 percent by weight of kernels.

f) Combination — 15 percent by weight of kernels for each style as specified in the marking.

4.3 Freedom from Moulds, Insects, etc

Walnuts in-shell or walnut kernels should be free from living insects and moulds and should be practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision), with such magnification as may be necessary in any particular case. If the magnification exceeds 10X, this fact should be stated in the test report.

4.4 Extraneous Matter

Walnuts in-shell or walnut kernels shall not have extraneous matter more than 0.25 percent by weight. Extraneous matter would include wood-splinters, husk dirt, walnut meal, shell pieces and any other foreign matter.

4.5 Grades

Grade designations and their quality characteristics of walnuts shall be as given in Annex A.

5 PACKING AND MARKING

5.1 Packing

Walnuts in-shell or walnut kernels should be packed in new, clean, B-twill jute bags (*see* IS 2566).

5.2 Marking

Each bag shall be marked or labelled giving the following particulars:

a) Name of the material;

b) Name and address of the packer/producer;

c) Net quantity;

d) Grade of the material;

e) Name of the country, where packed;

f) Any other marking required by the purchaser; and

g) Any other information required under the *Food Safety and Standards (Packaging and Labelling) Regulations*, 2011 and the *Legal Metrology (Packaged Commodities) Rules*, 2011.

6 SAMPLING

Representative samples of the material for testing conformity to this specification shall be drawn according to the method given in Appendix G of IS 4624.

ANNEX A

(*Clause* 4.5)

GRADE DESIGNATIONS AND QUALITY CHARACTERISTICS OF WALNUTS

A-1 WALNUTS IN-SHELL

Sl No.	Grade Designation	Grade Requirements	Grade Tolerance
(1)	(2)	(3)	(4)
i)	Extra class	a) Walnuts in-shell shall be of superior quality. b) They must have the characteristic of a variety and/or commercial type. They must be uniform in size, colour and development. c) They must be free of defects with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package. d) The walnuts in shell shall be of current year crop only.	a) Tolerance of 10 percent by number or weight of defects of the shell. b) Tolerance of 10 percent by number or weight of defects of edible part of which rotten or damaged by insects not to exceed 3 percent and mould walnuts not to exceed 3 percent. c) For fresh walnuts, the tolerance for defects of the Kernel shall not be more than 8 percent.
ii)	Class I	a) Walnuts in this class must be of good quality. b) They must have the characteristics of the variety and/ or commercial type or of a mixture of varieties. They must be uniform in size, colour and development. c) They may have following defects provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package: 1) Defects of shell, that is staining, discoloration not exceeding 5 percent of the total surface area of the shell; and 2) Adhering dirt, not exceeding 2 percent of the shell surface. d) The walnuts in-shell shall be of current year crop only.	a) Tolerance of 15 percent by number or weight of defects of the shell. b) Tolerance of 12 percent by number or weight of defects of edible part of which rotten or damaged by insects not to exceed 6 percent and mould walnuts not to exceed 4 percent. c) For fresh walnuts, the tolerance for defects of the kernel shall not be more than 12 percent.
iii)	Class II	a) This grade includes walnuts in-shell which do not qualify for inclusion in Extra Class and Class I, but satisfy the minimum requirements. b) They shall be uniform in colour, size and development. c) They may have following defects, provided the walnuts retain their essential characteristics as regards the general appearance, quality, the keeping quality and presentation in the package, 1) defects of shell, that is staining, discoloration not exceeding 10 percent of the total surface area of the shell. 2) adhering dirt, not exceeding 5 percent of the shell surface. 3) decaying of kernel not exceeding 4 percent of the total surface area. 4) visible damage of the kernel not exceeding 5 percent of the total surface.	a) Tolerance of 20 percent by number or weight of defects of the shell. b) Tolerance of 15 percent by number or weight of defects of edible part of which rotten or damaged by insects not to exceed 8 percent and mould walnuts not to exceed 6 percent. c) For fresh walnuts, the tolerance for defects of the kernel shall not be more than 15 percent.

A-2 SHELLED WALNUTS

Sl No. (1)	Grade Designation (2)	Grade Requirements (3)	Grade Tolerance (4)
i)	Extra class	a) Shelled walnuts shall be of superior quality. b) They must be characteristic of the variety and/or commercial type. They shall not have any defect and must be uniform in size and colour. c) Scuffing is allowed on, 1) quarters and all pieces; and 2) halves, provided it covers no more than 10 percent of the surface area of skin. d) They shall have light cream or light golden colour.	a) 4 percent by weight of shelled walnuts not satisfying the minimum requirements of which shell fragments or foreign matter shall not exceed 0.1 percent, rotten kernels shall not exceed 0.5 percent and mouldy kernels shall not exceed 0.5 percent. b) Tolerance of 8 percent by weight for kernels darker in colour.
ii)	Class I	a) Shelled walnuts shall be of good quality. b) They must be characteristic of the variety and/or commercial type. They must be uniform in size and colour. c) They may have slight defects of sunburns, blackened kernels not exceeding 4 percent of the total surface area. d) Scuffing is allowed on, 1) quarters and all pieces; and 2) halves, provided it covers no more than 20 percent of the surface area of skin. e) They shall have light cream, light golden or light amber colour.	a) 6 percent by weight of shelled walnuts not satisfying the minimum requirements of which shell fragments or foreign matter shall not exceed 0.1 percent, rotten kernels shall not exceed 1 percent and mouldy kernels shall not exceed 1 percent. b) Tolerance of 9 percent by weight for kernels darker in colour.
iii)	Class II	a) This grade includes shelled walnuts which do not qualify for inclusion in Extra Class and Class 1, but satisfy the minimum requirements. b) They shall be uniform in size and colour. c) They may have defects of sunburns, blackened kernels not exceeding 8 percent of the total surface area (scuffing is not considered as a defect). d) This class includes mixtures of kernels of different colours and designated in the marking by the words mixed colours. e) They shall have light cream, light golden, light amber or brown colour.	a) 8 percent by weight of walnut not satisfying the minimum requirements of which shell fragments or foreign matter shall not exceed 0.1 percent, rotten kernels shall not exceed 2 percent and mouldy kernels shall not exceed 2 percent. b) Tolerance of 10 percent by weight for kernels darker in colour.

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Amendments Issued Since Publication

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AMENDMENT NO. 1 APRIL 2019
TO
IS 7749 : 2016 WALNUTS — SPECIFICATION

(*First Revision*)

(*Page* 1, *clause* **2**) — Insert the following references at the appropriate place:

IS No.	*Title*
5887	Methods for detection of bacteria responsible for food poisoning
(Part 3) : 1999	General guidance on methods for the detection of *Salmonella* (*second revision*)
(Part 5) : 1976	Isolation, identification and enumeration of *Vibrio cholerae* and *Vibrio parahaemolyticus* (*first revision*)
14397 : 1996	Methods for detection, isolation and identification of pathogenic *E. coli* in foods
14988 (Part 1) : 2001	Microbiology of food and feeding stuffs — Horizontal method for detection and enumeration of *Listeria monocytogenes*:Part 1 Detection method

(*Page* 1, *clause* **3.2**) — Substitute the following for the existing clause:

'**3.2 Foreign Matter** — Extraneous matter, such as dirt, soil, sand, etc.'

(*Page* 1, *clause* **3.4**) — Substitute the following for the existing clause:

'**3.4 Decay** — Resulting from the action of microbes and insects.'

[*Page* 1, *clause* **4.1.1.1.1** g)] — Substitute the following for the existing clause:

'g) free from pests and their damages; and'

[*Page* 1, *clause* **4.1.1.2** d)] — Substitute the following for the existing clause:

'd) free from pests;'

[*Page* 2, *clause* **4.2.1.1** k)] — Substitute the following for the existing clause:

‘k) free from pests and their damages; and’

[*Page* 2, *clause* **4.2.1.2** a)] — Substitute the following for the existing clause:

‘a) infested or infected or shriveled; and’

(*Page* 2, *clause* **4.3**) — Substitute the following for the existing clause:

‘**4.3 Freedom from Microbes, Insects, etc**

Walnuts in-shell or walnut kernels should be free from living insects and microbes and should be practically free from dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision), with such magnification as may be necessary in any particular case. If the magnification exceeds 10X, this fact should be stated in the test report.’

(*Page* 3, *clause* **4.5**) — Insert the following new clause:

‘**4.6** The product shall conform to the microbiological requirements prescribed in Table 2.

Table 2 Microbiological Requirements for Walnuts

(*Clause*4.6)

Sl No.	**Characteristic**	**Requirement**				**Method of Test, Ref to IS**
		Sampling Plan1)		Limit (cfu)		
		n	*c*	*m*	*M*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	*Salmonella*	5	0	Absent/25g	NA	IS 5887 (Part 3)
ii)	*Listeria monocytogenes*	5	0	Absent/25g	NA	IS 14988 (Part 1)
iii)	*E. Coli* 0157 and Vero or Shiga toxin producing *E. coli*	5	0	Absent/25g	NA	IS 14397
iv)	*Vibrio cholerae*	5	0	Absent/25g	NA	IS 5887 (Part 5)

1)For sampling plan, *see* Annex B.

(*Page* 5, *Annex* A) — Insert the following new annex:

ANNEX B

(*Table* 2)

SAMPLING PLAN FOR MICROBIOLOGICAL REQUIREMENTS

B-1 SAMPLING PLAN FOR MICROBIOLOGICAL REQUIREMENTS

The terms n, c, m and M used in this standard have the following meaning:

n = number of units comprising a sample.

c = maximum allowable number of units having microbiological counts above m for 2- class sampling plan and between m and M for 3- class sampling plan.

m = microbiological limit that separates unsatisfactory from satisfactory in a 2- class sampling plan or acceptable from satisfactory in a 3-class sampling plan.

M = microbiological limit that separates unsatisfactory from satisfactory in a 3-class sampling plan.

B-2 INTERPRETATIONOF RESULTS

2-Class Sampling Plan (where n, c and m are specified)	3-Class Sampling Plan (where n, c, m and M are specified)
1. Satisfactory, if all the values observed are ≤ m 2. Unsatisfactory, if one or more of the values observed are > m or more than c values are > m	1. Satisfactory, if all the values observed are ≤ m 2. Acceptable, if a maximum of c values are between m and M and the rest of the values are observed as ≤ m 3. Unsatisfactory, if one or more of the values observed are > M or more than c values are > m

(FAD 10)

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